

## WHAT IS CLAIMED IS:

1. A self-expanding stent delivery system comprising:

5                   a substantially tubular shaft having a proximal end, a distal end, a guidewire lumen extending between the proximal and distal ends, and a stent bed proximate the distal end upon which the self-expanding stent is positioned; and

10                   a substantially tubular sheath defining an interior volume and coaxially positioned over the tubular shaft and stent, the tubular sheath including an outer polymeric layer and a substantially impenetrable and lubricious inner layer.

15                   2. The self-expanding stent delivery system according to Claim 1, wherein the outer polymeric layer comprises Nylon®.

20                   3. The self-expanding stent delivery system according to Claim 1, wherein the substantially impenetrable and lubricious inner layer comprises pyrolytic carbon.

4. The self-expanding stent delivery system according to Claim 3, wherein the pyrolytic coating is affixed directly to the polymeric layer.

25                   5. The self-expanding stent delivery system according to Claim 3, wherein the pyrolytic coating is affixed to a substrate, the substrate being affixed to the polymeric layer.

30                   6. The self-expanding stent delivery system according to Claim 1, wherein the substantially impenetrable and lubricious inner layer is affixed to the outer polymeric layer along the entire length of the tubular sheath.

7. The self-expanding stent delivery system according to Claim 1, wherein the substantially impenetrable and lubricious inner layer is affixed to the outer polymeric layer along the length of the tubular sheath proximate the stent bed.

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8. The self-expanding stent delivery system according to Claim 1, wherein the substantially impenetrable and lubricious inner layer comprises ceramic coatings.

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